

Agricultural Chemical Usage

The 2002 chemical use summaries for vegetables, field crops, and postharvest chemical provide pesticide data on 7 Michigan vegetables, soybeans, and chemical applications made to apples postharvest. Vegetable chemical use statistics are published every other year alternating with fruit chemical use statistics. Postharvest chemical use statistics for apples are published every 5 years. The

entire series of chemical usage statistics since 1990 for Michigan and the U.S. can be accessed at <http://www.usda.gov/nass>. A list of associated trade names is provided following the chemical application tables as an aid in reviewing data and does not mean to imply use of any specific trade name.

Asparagus: Agricultural chemical applications, 2002¹

Agricultural chemical	Area applied Percent	Applications Number	Rate per application Pounds per acre	Rate per crop year Pounds per acre	Total applied 1,000 lbs
Herbicides					
2,4-D	30	1	1.2	1.27	6
Diuron	96	1.8	1.24	2.3	35.3
Glyphosate	80	1.5	0.73	1.12	14.2
Linuron	8	1.2	0.62	0.74	0.9
Metribuzin	66	1.7	0.42	0.71	7.5
Paraquat	26	1.1	0.56	0.61	2.6
Insecticides					
Carbaryl	88	3.2	0.63	2.06	28.9
Chlorpyrifos	54	1	0.87	0.89	7.7
Permethrin	58	2.5	0.09	0.22	2
Fungicides					
Chlorothalonil	66	2.9	1.41	4.08	43.2
Mancozeb	26	2.2	1.43	3.27	13.4

¹ Planted acres in 2002 were 16,000 acres.

Snap Beans, Processing: Agricultural chemical applications, 2002¹

Agricultural chemical	Area applied Percent	Applications Number	Rate per application Pounds per acre	Rate per crop year Pounds per acre	Total applied 1,000 lbs
Herbicides					
Bentazon	46	1.0	0.09	0.09	0.7
EPTC	36	1.0	3.23	3.23	19.2
Fomesafen	32	1.0	0.12	0.12	0.7
S-Metolachlor	59	1.0	1.16	1.18	11.6
Trifluralin	31	1.0	0.59	0.59	3.1
Insecticides					
Acephate	25	1.1	0.76	0.88	3.7
Bifenthrin	50	1.1	0.04	0.05	0.4
Dimethoate	23	1.0	0.33	0.36	1.4
Disulfoton	31	1.0	0.88	0.88	4.6
Esfenvalerate	20	1.0	0.04	0.04	0.1

¹ Planted acres in 2002 were 16,700 acres.

Carrots, Fresh: Agricultural chemical applications, 2002¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
Herbicides					
Fluazifop-P-butyl	94	1.3	0.16	0.22	1
Linuron	74	2.5	0.52	1.32	4.6
Insecticides					
Esfenvalerate	28	4	0.03	0.12	0.2
Fungicides					
Chlorothalonil	84	4.7	0.84	3.94	15.5

¹ Planted acres in 2002 were 4,700 acres.

Sweet Corn, Fresh: Agricultural chemical applications, 2002¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
Herbicides					
2,4-D	(²)	1.0	0.53	0.53	0.1
Alachlor	12	1.0	2.13	2.13	2.9
Atrazine	78	1.2	0.86	1.11	9.5
Bentazon	34	1.0	0.53	0.54	2.0
Dimethenamid	2	1.0	0.89	0.89	0.2
Glyphosate	3	1.0	0.80	0.83	0.3
Pendimethalin	5	1.0	1.13	1.13	0.6
S-Metolachlor	58	1.0	1.11	1.11	7.1
Insecticides					
Carbaryl	6	3.0	0.91	2.75	1.7
Cyfluthrin	3	3.0	0.05	0.14	(³)
Esfenvalerate	12	2.6	0.04	0.10	0.1
Lambda-cyhalothrin	63	2.7	0.02	0.07	0.5
Methomyl	25	1.2	0.33	0.42	1.2
Permethrin	10	2.8	0.13	0.36	0.4
Terbufos	10	1.0	0.95	0.95	1.0
Thiodicarb	31	2.5	0.61	1.57	5.4
Fungicides					
Propiconazole	5	1.5	0.08	0.13	0.1

¹ Planted acres in 2002 were 11,000 acres.

² Area applied is less than one percent.

³ Total applied is less than 50 lbs.

Cucumbers, Fresh: Agricultural chemical applications, 2002¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
Herbicides					
Clomazone	28	1.0	0.14	0.14	0.3
Ethalfluralin	54	1.0	0.95	0.95	3.5
Glyphosate	3	1.9	1.10	2.11	0.5
Paraquat	33	1.0	0.63	0.63	1.4
S-Metolachlor	6	1.0	2.22	2.22	0.9
Insecticides					
Carbaryl	12	1.5	0.92	1.39	1.1
Endosulfan	47	1.9	0.51	0.99	3.1
Esfenvalerate	45	1.7	0.04	0.06	0.2
Permethrin	21	1.0	0.05	0.05	0.1
Fungicides					
Chlorothalonil	76	1.9	1.33	2.59	13.4
Copper hydroxide	74	1.9	0.37	0.71	3.6
Other Chemicals					
Chloropicrin	5	1.0	97.12	97.12	31.4

¹ Planted acres in 2002 were 6,800 acres.

Cucumbers, Pickles: Agricultural chemical applications, 2002¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
Herbicides					
Clomazone	59	1.0	0.13	0.13	2.7
Ethalfluralin	70	1.0	0.57	0.57	14.1
Halosulfuron	31	1.0	0.02	0.02	0.2
Naptalam	17	1.0	0.75	0.76	4.6
Insecticides					
Carbaryl	4	1.1	0.60	0.68	0.9
Carbofuran	13	1.0	0.99	0.99	4.4
Endosulfan	1	3.0	0.49	1.52	0.8
Esfenvalerate	4	1.4	0.03	0.05	0.1
Fungicides					
Chlorothalonil	12	1.3	1.41	1.91	8.2
Copper hydroxide	6	1.5	0.55	0.87	1.8
Mefenoxam	10	1.0	0.11	0.11	0.4

¹ Planted acres in 2002 were 35,500 acres.

Pumpkins: Agricultural chemical applications, 2002¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
Herbicides					
Bensulide	(²)	1.0	4.76	4.76	0.2
Clomazone	44	1.0	0.38	0.39	1.0
Ethalfluralin	37	1.0	0.68	0.70	1.6
Glyphosate	4	1.0	0.68	0.69	0.2
Trifluralin	3	1.0	0.71	0.71	0.1
Insecticides					
Carbaryl	30	1.8	0.90	1.70	3.1
Endosulfan	9	2.0	0.70	1.42	0.7
Esfenvalerate	37	2.7	0.03	0.09	0.2
Malathion	2	1.0	0.74	0.79	0.1
Fungicides					
Azoxystrobin	3	1.0	0.20	0.20	(³)
Chlorothalonil	48	2.5	1.35	3.39	9.8
Copper hydroxide	23	1.8	0.51	0.93	1.3
Mancozeb	2	2.0	0.79	1.62	0.2
Mefenoxam	7	1.5	0.18	0.27	0.1
Myclobutanil	36	1.5	0.09	0.15	0.3
Thiophanate-methyl	3	2.0	0.65	1.33	0.2
Triadimefon	6	1.0	0.07	0.07	
Trifloxystrobin	20	2.2	0.06	0.13	0.2

¹ Planted acres in 2002 were 6,000 acres.

² Area applied is less than one percent.

³ Total applied is less than 50 lbs.

Squash: Agricultural chemical applications, 2002¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
Herbicides					
Bensulide	(²)	1.0	4.42	4.42	0.2
Clomazone	35	1.0	0.17	0.17	0.4
Ethalfluralin	60	1.0	0.83	0.85	3.7
Glyphosate	5	1.4	0.79	1.15	0.4
Insecticides					
Carbaryl	40	2.4	0.84	2.09	6.0
Carbofuran	13	1.0	0.59	0.59	0.5
Diazinon	1	1.1	1.64	1.83	0.2
Endosulfan	13	2.7	0.57	1.60	1.5
Esfenvalerate	27	1.9	0.04	0.07	0.1
Malathion	4	2.3	0.81	1.90	0.6
Permethrin	20	1.5	0.14	0.21	0.3
Fungicides					
Chlorothalonil	63	2.7	1.44	3.87	17.4
Copper hydroxide	30	2.7	0.54	1.47	3.2
Mefenoxam	16	1.7	0.10	0.18	0.2
Myclobutanil	13	1.4	0.10	0.14	0.1
Thiophanate-methyl	4	1.6	0.31	0.51	0.1

¹ Planted acres in 2002 were 7,200 acres.

² Area applied is less than one percent.

Apples: Postharvest chemical applications, 2001-02 marketing year^{1,2}

Agricultural chemical	Volume treated	Applications	Rate per application	Rate per market year	Total applied
	Percent	Number	Pounds per 1,000 lbs	Pounds per 1,000 lbs	1,000 lbs
Diphenylamine	2.16	1.0	(³)	(³)	0.1
Thiabendazole	9.13	1.0	0.04	0.04	4.3
	7.34	1.1	0.01	0.01	1.0

¹ Volume handled by Michigan apple storage and processing facilities was 1,261 million pounds.

² Insufficient or limited reports to publish usage data for alkaline cleaner, calcium chloride, captan, chlorine, dodecylbenzene sodium sulfonate, and fruit wax.

³ Rate applied is less than 0.01 pounds per 1,000 pounds.

Agricultural chemical applications: Soybeans, 2002¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 pounds
Herbicides					
Glyphosate	82	1.2	0.86	1.06	1,791
Glyphosate diam salt	9	1.3	0.71	0.92	163
Imazethapyr	12	1.0	0.06	0.06	14

¹ Planted acres in 2002 were 2.05 million acres.

Fertilizer applications: Soybeans, 2002¹

Fertilizer	Symbol	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	Million pounds	
Nitrogen	N	44	1.0	26	27	24.4
Phosphate	P ₂ O ₅	34	1.0	46	46	32.0
Potash	K ₂ O	67	1.0	82	87	119.1

¹ Planted acres in 2002 were 2.05 million acres.

Agricultural chemicals: Common and trade names by class

Herbicides		Insecticides	
Common name	Trade name	Common name	Trade name
2, 4-D	several names	Acephate	Acephate, Orthene, Payload
Alachlor	Bullet, Lasso, Lasso II, Lariat, Micro-Tech, Saddle	Bifenthrin	Attain, Brigade, Capture, Talstar
Atrazine	several names	Carbaryl	Agway Fruit Tree Spray, Carbaryl, Sevin
Bensulide	Prefar	Carbofuran	Furadan
Bentazon	Basagran, Laddok, Pledge, Laddok S-12, Basagran T/O	Chlorpyrifos	several names
Clomazone	Command	Cyfluthrin	Baythroid, Decathlon, Duraplex, Tempo Aztec
Dimethenamid	Guardsman, Frontier, LeadOff, OpTill	Diazinon	Diazinon, Knox Out, Spectracide, Spectracide 25
Diuron	Direx, Diuron, Karmex, Krovar, Sprakil	Dimethoate	Cygon, Digon, Dimate, Dimethoate
EPTC	Eptam, Eradicane Extra	Disulfoton	Dimet, Cymate, De-Fend
Ethalfluralin	Sonalan, Curbit, Strategy	Endosulfan	Di-Syston
Fluazifop-P-butyl	Fusilade, Fusion, Ornamec	Esfenvalerate	Endocide, Endosulfan, Phaser, Thiodan Thirethrin
Fomesafen	Reflex	Lambda-cyhalothrin	Asana
Glyphosate	several names	Malathion	Karate, Warrior
Glyphosate diam salt	Touchdown	Methomyl	Agway Fruit Tree Spray, Cythion, Fyfanon, Green Devil, Malathion, Atrapa
Halosulfuron	Permit, Yukon, Sandea	Permethrin	Lannate, Methomyl
Imazethapyr	Pursuit, Pursuit W, Pursuit Plus, Lightning, Extreme, Steel	Terbufos	several names
Linuron	Linex, Lorox	Thiodicarb	Counter
Metribuzin	Lexone, Sencor, Axiom		Larvin
Naptalam	Alanap		
Paraquat	Cyclone, Gramoxone		
Pendimethalin	Corral, OH 2, Pendimax, Pendulum, Prowl, Pursuit Plus, Squadron, Steel, Stomp		
S-Metolachlor	several names		
Trifluralin	Preen, Snapshot, Treflan, Trifluralin, Trilin Trust		
Fungicides			
Azoxystrobin	Abound, Heritage, ICIA5504, Quadris		
Chlorothalonil	several names		
Copper hydroxide	several names		
Mancozeb	several names		
Mefenoxam	Flouronil, Quell, Ridomil, Subdue		
Myclobutanil	Eagle, Laredo, Nova, Rally, RH-144228, Systhane		
Propiconazole	Banner, Orbit, Tilt, Stratego		
Thiabendazole	several names		
Thiophanate-methyl	Duosan, Fungo Flo, Systec, Topsin, Zyban		
Triadimefon	Bayleton, Reach		
Trifloxystrobin	Compass, Flint		
Other			
	Chloropicrin	several names	
	Chlorine dioxide	Chlorine dioxide	
	Diphenylamine	several names	

Commercial fertilizer consumption: 1998-2002¹

Item	Year ending June 30				
	1998 <i>Short tons</i>	1999 <i>Short tons</i>	2000 <i>Short tons</i>	2001 <i>Short tons</i>	2002 <i>Short tons</i>
Primary plant nutrients					
Total N	248,102	263,948	249,543	238,810	240,680
N in multi-nutrients	58,790	62,713	57,104	55,076	55,048
Total P ₂ O ₅	92,236	94,890	87,001	85,873	84,734
P ₂ O ₅ in multi-nutrients	90,323	92,063	84,539	83,794	82,377
Total K ₂ O	213,954	211,739	202,481	184,568	189,200
K ₂ O in multi-nutrients	66,246	60,635	47,828	47,563	41,924
Total plant nutrients	554,291	570,576	539,024	509,251	514,615
Average analysis	44.8	43.1	42.9	42.6	43.1
Total nutrients in multi-nutrients	215,360	215,411	189,471	186,433	179,349
Selected single-nutrient materials					
Ammonium nitrate	6,483	9,533	5,622	6,287	5,405
Anhydrous ammonia	71,765	68,349	56,757	50,984	52,766
Nitrogen solutions	269,136	300,761	265,544	288,641	284,355
Urea	88,167	98,820	126,452	110,001	107,305
Ammonium sulfate	20,168	20,468	22,477	22,164	23,569
Concentrated superphosphate	3,961	4,880	4,966	3,945	4,984
Potassium chloride	237,257	244,519	250,410	221,427	236,720
Multiple-nutrient fertilizers					
N-P-K	387,053	388,303	361,992	366,861	334,670
N-P	115,178	124,833	115,616	122,840	129,900
N-K	26,527	27,386	22,281	24,353	27,096
P-K	7,891	5,526	4,561	4,771	3,831
Leading multiple-nutrient grades					
10-34-0	35,525	42,668	37,385	40,775	44,303
18-46-0	36,974	37,709	34,569	33,232	36,672
11-52-0	14,860	20,069	24,987	26,571	24,636
19-19-19	18,527	21,201	11,564	13,035	13,989
9-24-3	2,917	4,674	8,510	9,150	11,627
28-3-3		5,265	5,595	4,517	7,761
Fertilizer consumption by classes					
Dry bulk single-nutrient	401,282	430,931	452,227	382,845	392,966
Dry bagged single-nutrient	9,267	7,581	7,453	14,862	23,385
Fluid single-nutrient	348,333	371,425	324,357	343,883	339,295
Dry bulk multiple-nutrient	293,499	283,761	259,482	243,576	223,668
Dry bagged multiple-nutrient	179,578	187,767	165,491	188,375	187,396
Fluid multiple-nutrient	63,570	76,463	79,476	86,874	84,433
Organics, secondary and micronutrients	38,839	37,943	39,220	24,729	31,883
Total	1,334,370	1,395,870	1,327,707	1,285,144	1,283,026

¹ Source: The Association of American Plant Food Control Officials